

REMARKS

Applicants gratefully acknowledge the interview granted to their representative on August 18, 2004, and particularly to Examiner Im and (Acting) Supervisory Examiner Loke for their courteous assistance during the interview. The substance of that interview is summarized and expanded upon below.

As was discussed during the interview, the claims have been amended to more clearly recite that the semi-insulating layer is a non-composite layer. This amendment makes it clear that the semi-insulating layer is a single layer and not a multilayer. Support is found in the specification as originally filed, and no new matter is believed to be added. As was also discussed during the interview, this amendment should be entered on the grounds that the finality of the present Official Action is believed to be improper: Claim 47 was rejected for the first time. In any event, as was discussed at the interview, Applicants kindly submit that with the present remarks and amendments, the case is now ready for allowance and issue. Claims 1-2 and 5-54 are pending.

As was discussed during the interview, the boundaries of the claims are clear and they are not indefinite. The invention is set out clearly in the claims and should not be limited based on the comments at page 2 of the Official Action. Applicants kindly point out that the broadest claims in the case do not recite either a “p-type SiC layer (with boron; an acceptor) on the n-type SiC substrate (with nitrogen; a donor)” or “isolation by the trench between them” (Office Action page 2). Applicants also kindly submit that the limitations of Claim 47 are clear and further that the claims should not be limited by the preferred embodiments shown in the figures. The indefiniteness rejection should be withdrawn accordingly.

The anticipation rejection is unsustainable, and it should be withdrawn. The claims are not anticipated by U.S. Patent No. 5,270,554 to Palmour, even when considered with U.S. Patent

No. 5,967,794 to Kodama. Neither Palmour nor Kodama disclose or suggest the present invention, which requires at least a non-composite semi-insulating silicon carbide layer formed on the substrate, the semi-insulating silicon carbide layer comprising boron and a shallow donor impurity, the semi-insulating silicon carbide layer having boron-related D-center defects. Applicants kindly request that the anticipation rejection be withdrawn.

The Office rejects Claims 38-40, 44 and 52-54 as assertedly obvious over the combination of U.S. Patent No. 6,310,385 to Ajit and Palmour. The Office asserts that it would have been obvious to replace Ajit's semi-insulator layer 40 (column 3, lines 6-11) with Palmour's boron-doped SiC semi-insulator (column 8, lines 39-64). As discussed during the interview, the Office has not established sufficient motivation to combine these references.

First, Palmour teaches that his SiC layer (the “first epitaxial layer”) is optional and may be eliminated entirely (column 6, lines 61-66). There is no compelling reason to use Palmour's semi-insulating layer in Ajit when Palmour discloses that this layer is optional. Second, Palmour teaches away from the only substrate named in Ajit. Palmour discloses that the boron-doped SiC semi-insulating layer is formed over only a bulk single crystal silicon carbide substrate (column 3, lines 18-24). In contrast, the only substrates disclosed in Ajit are silicon and some unnamed N-type semiconductor substrate (column 3, lines 6-11 and 50-60). Palmour states that an SiC epitaxial layer grown on a Si substrate “has different electrical and thermal characteristics” than an SiC epitaxial grown on a different substrate (column 2, lines 55-57). Palmour further recites that:

“the use of a Si substrate limits the ability of such devices to dissipate heat and the growth of SiC on Si results in defects in the epitaxial layers which result in high leakage current when the device is in operation” (column 2, lines 60-64).

In view of this teaching away from the combination, the Office has not set out sufficient reasons why one would combine the teachings of Palmour and Ajit or what success one would

expect from the combination. Applicants kindly request that the rejection be withdrawn accordingly.


The Office rejects Claims 16-18 as assertedly obvious over the combination of Palmour and U.S. Patent No. 4,794,608 to Fujita, et al. These are dependent claims, which incorporate all the limitations of Claim 1 by reference. Since Palmour does not anticipate or obviate the broad claims, the addition of the Fujita et al. reference cannot make these dependent claims obvious.

The Office rejects Claims 41-43 and 45-48 as being obvious over the combination of Ajit, Palmour and U.S. Patent No. 6,303,508 to Alok. Again, these are dependent claims, which incorporate the limitations of at least independent Claim 38 by reference. The combination of Palmour and Ajit, as noted above, does not obviate the invention of Claim 38, and the addition of the Alok reference cannot make these dependent claims obvious. This rejection should be withdrawn accordingly.

This application is now in condition for allowance and issue and an early and favorable indication of same is kindly requested. If any points remain at issue, however, the Examiner is kindly requested to contact the undersigned at the telephone number listed below, who would be happy to provide any assistance in putting this case into even better condition for allowance.

Respectfully submitted,

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